



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/427,775	10/26/1999	JERRY D. KIDD	TUEC.IP2005	3747
7590	10/12/2004		EXAMINER	
ROBERT J WARD ESQ WORSHAM FORSYTHE & WOOLDRIDGE LLP ENERGY PLAZA 30TH FLOOR 1601 BRYAN STREET DALLAS, TX 752013402			PADGETT, MARIANNE L	
ART UNIT	PAPER NUMBER	1762		
DATE MAILED: 10/12/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/427,775	KIDD ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Marianne L. Padgett	1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 5/10/04 & 6/14/04.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) 104-109, 115, 116 and 134-150 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5, 7-17, 25, 27-50, 52-62, 67, 68, 70-82, 85-88, 90-103, 111-114, 117-129 and 132 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All
  - b) Some \*
  - c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>6/14/04</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

Continuation of Disposition of Claims: Claims pending in the application are 1-5,7-17,25,27-50,52-62,67,68,70-82,85-88,90-109,111-129, 132, 134-150.

34  
A  
MPP

Art Unit: 1762

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-5, 7, 8, 15-17, 24, 25, 27-28, 32-50, 52-57, 59-62, 67-68, 70-81, 85-88, 90-95, 98-103, 105, 111-114, 118-129 and 132 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (4,420,386 or 4,468,309), as applied in sections 4 of Paper No. 13 (mailed 5/22/02) and section 8 of Paper No. 21 (mailed 10/10/03), in view of Sakamoto et al (4,725,345) or Yaginuma et al (6,117,280) or Nimmagadda (4,540,596).

Claim 1 has been amended to narrow the voltage of the negative DC signal to the substrate to be between 1-1,500 volts, while claim 129 is noted to limit the DC to between 500-750 volts. The White references have generic teachings of using RF+DC on the substrate (column 2, lines 59-68 in (386)), with exemplary values of negative bias given as 3-5 KV (3,000-5,000 volts), hence while the general disclosure is suggestive of a broader possible range, there is no explicit disclosure of using lower DC values with the RF to cause the taught attraction of ions.

The particular effects of a specific range of DC voltage with respect to the taught attraction for the deposition would have been expected to vary with the particular overall composition of the deposition environment. Thus the material being deposited, as illustrated by Sakamoto et al (D.C. voltage of hundreds of volts for ion plating process of Ti + Ar + H<sub>2</sub>, columns 5-6); Yaginuma et al (Examples 1-6 use DC bias voltages of -400 V for cleaning with H<sub>2</sub>, -500 V for nitriding with ammonia, -1000 V when metal, such as Ti vapor is being supplied, etc., column 7-11); or Nimmagadda (claim 1 teaches metal nitrides, oxide or carbides, where -50 to -500 volts DC are used for deposition, lowered from -500 to -5000 V DC for cleaning). Therefore, it would have been obvious for one of ordinary skill in the art to determine optimum DC voltage to attract deposition ions to the substrate being coated, depending with specific reagents being employed, noting that the prior art recognizes use of higher absolute values of voltages for cleaning operations, which will be generally removing rather than depositing material. It is noted that the independent claims are completely generic as to the deposit and applicant's specification (page 3) teaches 1-5000 V negative DC with no special effect attributed to the now lower claimed range. The paragraph bridging pages 29-30 teaches 1-5000 V, preferably negative, but not always required, as in a preferred embodiment -500 to -750 V, but no special effects are attributed to use of these values in the specification. Applicants allege that 3-5 KV results in undesirable or unacceptable damage (page 28, responses of 5/10/04). Where is this taught in the specification that actually teaches use of such values? As seen above in the prior art, more energetic ions are generally known to be used for cleaning thus etching, than for deposition, hence it would appear that applicant might be referring to this well known concept.

Art Unit: 1762

3. Claims 29-31 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (386 or 309), in view of Sakamoto et al or Yaginuma et al or Nimmagadda as applied to claims 1-5, 7, 8, 15-17, 24-25, 27-28, 32-50, 52-57, 59-62, 67-68, 70-81, 85-88, 90-95, 98-103, 105, 111-114, 118-129 and 132 above, and further in view of Grossman et al (5,078,847), as discussed in Section 5 of Paper No. 13 (mailed 5/22/02) and Section 9 of Paper No. 21 (mailed 11/10/03).

4. Claims 8-14 and 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (386 or 309), in view of Sakamoto et al or Yaginuma et al or Nimmagadda as applied to claims 1-5, 7, 8, 15-17, 24-25, 27-28, 32-50, 52-57, 59-62, 67-68, 70-81, 85-88, 90-95, 98-103, 105, 111-114, 118-129 and 132 above, and further in view of White (4,667,620) as applied in Section 6 of Paper No. 13 (5/22/02).

5. Claims 96, 97 and 103 are rejected under 35 U.S.C. 103(a) as being unpatentable over of White (386 or 309), in view of Sakamoto et al or Yaginuma et al or Nimmagadda as applied to claims 1-5, 7, 8, 15-17, 24-25, 27-28, 32-50, 52-57, 59-62, 67-68, 70-81, 85-88, 90-95, 98-103, 105, 111-114, 118-129 and 132 above, and further in view of Mattox (3,329,601) as applied in Section 8 of Paper No. 13.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over White (309), in view of in view of Sakamoto et al as applied to claims 1-5, 7, 8, 15-17, 24-25, 27-28, 32-50, 52-57, 59-62, 67-68, 70-81, 85-88, 90-95, 98-103, 105, 111-114, 118-129 and 132 above, and further in view of Section 10 of Paper No. 13 and as discussed above.

7. Applicant's arguments filed May 10, 2004 and discussed above have been fully considered but they are not persuasive.

Art Unit: 1762

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on Monday-Friday from about 8:30 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M.L. Padgett/dh  
September 16, 2004

October 8, 2004



**MARIANNE PADGETT**  
**PRIMARY EXAMINER**